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EXAMINER

JAKOVAC, RYAN J

ART UNIT

PAPER NUMBER

2445

NOTIFICATION DATE

DELIVERY MODE

10/06/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed 08/03/2009 has been entered.

Response to Arguments

2. Applicant's arguments filed 08/03/2009 have been fully considered but they are not persuasive.

3. Applicant argues in summary that the combination of RFC2547bis and RFC1771 does not teach managing VRF tables at a provider edge (PE) router. However, the examiner respectfully disagrees. At least pgs. 9-10 of RFC2547bis disclose that PE routers maintain routing information. This routing information is managed by the PE routers as described in at least pg. 15 which discloses that PE routers acquire and disseminate routes using VRF tables. See also pg. 16 disclosing PE route distribution.

4. Applicant argues in summary that the combination of RFC2547bis and RFC1771 does not disclose modifying an ImpRT attribute of a first VRF table in the PE router. However, at least pg. 16 of RFC2547bis discloses route installation and distribution. Pg. 17 subsequently discloses translating route attributes in order to create distinct or multiple routes within a system. See also pg. 20-21 which discloses that routes are converted and imported into VRFs.

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5. Applicant argues in summary that the combination of RFC2547bis and RFC1771 does not teach searching for routes in a second VRF table and copying routes from one VRF to another based upon matching ImpRTs. However, pg. 21 discloses that routes are copied into multiple VRFs used for routing traffic from corresponding sites based on matching route targets. Every VRF is associated with one or more route target attributes and that upon the creating/importation of a route, that route is associated with one or more route target attributes. See also, pg. 11-13 of RFC2547bis which discloses that multiple forwarding tables are used in the PEs. See also pg. 18 which discloses that routes leading to a particular CE become associated with a particular routing attribute. This is done by translating the routing addresses and storing them in the VRF's for their associated sites or VPNS (RFC2547bis, pg. 17). Stored routes are then copied as export routes (RFC2547bis, pg. 20).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. Claims 1-3, 5, 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over RFC2547bis - BGP/MPLS IP VPSs (hereinafter RFC2547bis) in view of RFC1771 – A Border Gateway Protocol 4 (hereinafter RFC1771).

Regarding claim 1, 5, 10, the combination of RFC2547bis and RFC1771 teaches a method of managing virtual routing forwarding (VRF) tables at a provider edge PE router of a L3 virtual private network (VPN), said PE router maintaining a VPN-IP master routing information base (RIB) and a sub-RIB for each said VRF table (RFC1771, pg. 6.), comprising the steps of:

maintaining an import route target (ImpRT) tree comprising all ImpRT attributes currently configured on said PE router (RFC2547bis, pg. 6, PE routers contain routing information about the VPNs they are directly connected to. Pg. 9-10, PE routers maintain a number of separate forwarding tables. See also pg. 31.);

modifying an ImpRT attribute of a first VRF table in said PE router (RFC2547bis, pg. 21, routes associated with route targets are distributed to VRF tables associated with the route target. See also, pg. 23, PE routers distribute routes to each other. See also, pg. 25);

searching said ImpRT tree for a match to said ImpRT attribute to identify a second VRF table in said PE router having a matching ImpRTi attribute (RFC2547bis, pg. 7-12, 14, when an IP packet is received the destination IP address is searched for. The ingress VRF is identified and used for incoming packets.);

for peers that do not support the route refresh feature, maintaining a rejected routes tree (RFC2547bis, pg. 27-29, invalid/unused routes are stored in order to protect against the need to reacquire (for example through a route refresh) all such routes if the clients' "disappearance" is only temporary.);

searching for routes in a sub-RIB associated with said second VRF table (RFC2547bis, pg. 20-25, routes imported into VRF tables. See also pg. 7-12, 14.); and

copying said routes from said sub-RIB into said first VRF table based on all route target attributes configured for said first VRF table, including said modified ImpRT attribute (RFC2547bis, pg. 7-12, 14. See also, 20-25, routes imported into VRF tables.).

RFC1171 discloses for peers supporting a route refresh feature, performing a route refresh operation only when a match is not found (RFC1771, pg. 43-44, when a new route is received (i.e. not matched to an existing route), the route is updated to all other BGP speakers (i.e. route refresh).); and updating said VRFi table accordingly, using an association between each said VRF table and a respective sub-RIB (RFC2547bis, pg. 21, VRF tables are updated with route target attributes.).

It would have been obvious to one of ordinary skill in the art at the time of invention to combine performing a route refresh operation only when a match is not found as taught by RFC1771 with the method of RFC2547bis in order to provide internal updates (RFC1771, pg. 43-44) and since RFC2547bis is concerned with route distribution among PEs by BGP and RFC1771 details known methods of route distribution using BGP.

Regarding claim 2, the combination of RFC2547bis and RFC1771 teaches the method of claim 1, further comprising: maintaining a list of all ImpRT attributes at a PE node, each ImpRT attribute being associated with all VRF tables that are currently configured with said modified ImpRT attribute (RFC2547bis, pg. 6, PE routers contain routing information about the VPNs they are directly connected to. Pg. 9-10, PE routers maintain a number of separate forwarding tables.).

Regarding claim 3, 8, the combination of RFC2547bis and RFC1771 teaches the method of claim 1, further comprising adding said ImpRT attribute to said first VRF table (RFC2547bis, pg. 20, routes are imported (i.e. added) into VRF tables.).

Regarding claim 9, the combination of RFC2547bis and RFC1771 teaches the method of claim 2, wherein said searching is performed through said master RIB (RFC1771, pg. 43-44, see also pg. 5-7.).

Regarding claim 11-14, the combination of RFC2547bis and RFC1771 teaches the method of claim 1, further comprising removing said import route target ImpRTi from said first VRFi table (RFC2547bis, pg. 25, the PE discards all the routes which no longer have any of the PE's VRF's import targets as one of their route target attributes. See also, RFC1771, pg. 36, withdrawal of routes.).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN J. JAKOVAC whose telephone number is (571)270-5003. The examiner can normally be reached on Monday through Friday, 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on 571-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ryan Jakovac/

/VIVEK SRIVASTAVA/

Supervisory Patent Examiner, Art Unit 2445